

### **AMENDMENTS TO THE CLAIMS**

The listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of the claims**

Please amend the claims where indicated below:

1. (*currently amended*)      A vertical cavity surface emitting laser (VCSEL),  
comprising:  
an active region further comprising at least one quantum well having a depth of at least 40 meV, wherein said depth is defined as using the difference between a valence band offset and a conduction band offset, said quantum well being comprised of InGaAsSb and barrier layers sandwiching said at least one quantum well; and  
confinement layers sandwiching said active region.
2. (*original*)      The VCSEL of claim 1 wherein said barrier layers are comprised of GaAsN.
3. (*original*)      The VCSEL of claim 1 wherein said barrier layers are comprised of GaAsP.
4. (*original*)      The VCSEL of claim 1 wherein said barrier layers are comprised of AlGaAs.

5. *(original)* The VCSEL of claim 1 wherein said confinement layers are comprised of AlGaAs.

6. *(original)* The VCSEL of claim 1 wherein said quantum well is up to and including 50Å in thickness.

7. *(original)* The VCSEL of claim 2 wherein said confinement layers are comprised of AlGaAs.

8. *(original)* The VCSEL of claim 7 wherein said quantum well is up to and including 50Å in thickness.

9. *(original)* The VCSEL of claim 3 wherein said confinement layers are comprised of AlGaAs.

10. *(original)* The VCSEL of claim 9 wherein said quantum well is up to and including 50Å in thickness.

11. *(original)* The VCSEL of claim 4 wherein said confinement layers are comprised of AlGaAs.

12. *(original)* The VCSEL of claim 11 wherein said quantum well is up to and including 50Å in thickness.

13. *(previously presented)* The VCSEL of claim 1 wherein said at least one quantum well further comprises >1% N.

14. *(original)* The VCSEL of claim 13 wherein said quantum well is up to and including 50Å in thickness.

15. *(original)* The VCSEL of claim 13 wherein said barrier layers are comprised of GaAsN.

16. *(original)* The VCSEL of claim 15 wherein said quantum well is up to and including 50Å in thickness.

17. *(original)* The VCSEL of claim 13 wherein said barrier layers are comprised of GaAsP.

18. *(original)* The VCSEL of claim 17 wherein said quantum well is up to and including 50Å in thickness.

19. *(original)* The VCSEL of claim 13 wherein said barrier layers are comprised of AlGaAs.

20. (*original*) The VCSEL of claim 19 wherein said quantum well is up to and including 50Å in thickness.

21. (*original*) The VCSEL of claim 13 wherein said confinement layers are comprised of AlGaAs.

22. (*original*) The VCSEL of claim 21 wherein said quantum well is up to and including 50Å in thickness.

23. (*original*) The VCSEL of claim 15 wherein said confinement layers are comprised of AlGaAs.

24. (*original*) The VCSEL of claim 23 wherein said quantum well is up to and including 50Å in thickness.

25. (*previously presented*) The VCSEL of claim 17 wherein said confinement layers are comprised of AlGaAs.

26. (*original*) The VCSEL of claim 25 wherein said quantum well is up to and including 50Å in thickness.

27. (*original*) The VCSEL of claim 19 wherein said confinement layers are comprised of AlGaAs.

28. The VCSEL of claim 27 wherein said quantum well is up to and including 50Å in thickness.

Claims 29. – 44 (*cancelled*).

45. (*currently amended*) A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum well comprised of material including InGaAsSb and greater than 1 % nitrogen, said at least one quantum well having a depth of at least 40 meV, wherein said depth is defined as using the difference between a valence band offset and a conduction band offset, and barrier layers sandwiching said at least one quantum well; and

confinement layers sandwiching said active region.

46. (*previously presented*) The VCSEL of claim 45 wherein said barrier layers are comprised of GaAsN.

47. (*previously presented*) The VCSEL of claim 45 wherein said barrier layers are comprised of GaAs and at least one of P and Al.

48. (*previously presented*) The VCSEL of claim 45 wherein said confinement layers are comprised of AlGaAs.

49. *(previously presented)* The VCSEL of claim 46 wherein said confinement layers are comprised of AlGaAs.

50. *(previously presented)* The VCSEL of claim 47 wherein said barrier layers are comprised of AlGaAs.

51. *(previously presented)* The VCSEL of claim 48 wherein said barrier layers are comprised of GaAsN.

52. *(previously presented)* The VCSEL of claim 48 wherein said barrier layers are comprised of GaAs and at least one of P and Al.

53. *(currently amended)* A vertical cavity surface emitting laser (VCSEL), comprising:

an active region further comprising at least one quantum comprised of material including InGaAsSb and greater than 1 % nitrogen, said at least one quantum well having a depth of at least 40 meV, wherein said depth is defined as using the difference between a valence band offset and a conduction band offset, said quantum well including thickness up to and including 50Å, and barrier layers sandwiching said at least one quantum well; and confinement layers sandwiching said active region.

54. *(previously presented)* The VCSEL of claim 53 wherein said barrier layers are comprised of GaAsN.

55. *(previously presented)* The VCSEL of claim 53 wherein said barrier layers are comprised of GaAs and at least one of P and Al.

56. *(previously presented)* The VCSEL of claim 53 wherein said confinement layers are comprised of AlGaAs.

57. *(previously presented)* The VCSEL of claim 54 wherein said confinement layers are comprised of AlGaAs.

58. *(previously presented)* The VCSEL of claim 55 wherein said confinement layers are comprised of AlGaAs.

59. *(previously presented)* The VCSEL of claim 56 wherein said barrier layers are comprised of GaAs and at least one of N, P and Al.